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ABSTRACT

Information on the development and evaluation of a workshop to improve residents' clinical teaching at the Louisiana State University School of Medicine is presented. Over a 2-year period, residents from all specialties participated in the workshop. A majority of residents rated the workshop favorably, and 70 percent requested additional training. For 97 residents who provided before/after ratings of their teaching skills, post-workshop ratings were significantly higher than pre-workshop ratings. Ratings of 38 residents by 257 third-year medical students showed pre- to post-workshop improvement on the following dimensions of clinical teaching: organization/clarity, clinical skills, knowledge/analytical ability, and provision of direction and feedback. Additional training to improve 68 residents' clinical teaching behaviors is being developed and evaluated in a 3-year experimental study. Videotapes of resident/student case presentations are used to instruct residents, and trained raters measure the teaching behaviors observed by videotapes. Structured interviews will also be conducted to explore residents' awareness and motivation regarding teaching. A pyramid training system that would involve teachers, residents, and students is recommended. (SW)

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Improving Clinical Teaching: Focus on Residents

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Abstract

Over a two year period residents from all specialties have participated in a workshop to improve their clinical teaching skills. Three measures have evaluated the workshop's effectiveness. A majority of the residents rated the workshop as a profitable learning experience on a participant evaluation form; 70% asked for additional training. 97 residents rated their teaching skills before and after the workshop; their post workshop ratings were significantly higher than their pre-workshop ratings. 257 third-year student ratings of 38 residents showed pre to post workshop improvement on the following four dimensions of clinical teaching:organization/clarity, knowledgeable/analytical, demonstrates clinical skills, and provides direction and feedback.

Additional training to improve 68 residents' clinical teaching behaviors is being developed and evaluated in a three-year experimental study. Videotapes of resident/student case presentations are used to instruct residents; trained raters measure the teaching behaviors observed on the videotapes. In addition to the quantitative evaluation methods, structured interviews will be conducted to probe residents' awareness and motivation regarding reaching.

A complete program to improve clinical instruction would involve faculty, residents, and students in a pyramid training system. Instructional methods for each group of persons would be selected so as to enhance and support their respective positions within the patient care team.

A gap in research exists between efforts to improve clinical teaching and evaluation of those efforts (Stritter, Kappelman, Irby, and Skeff, 1983). Stritter's (1983) review of faculty development in the health professions has summarized results of types of faculty development. Observation (live and videotaped) and consultation with educators and peers have demonstrated improvement in teaching behaviors (Irby, DeMars, Scher, and Matthews. 1976; Foley, Smilansky, Sajid, 1976; Skeff, 1983). Although relatively little research on the effect of short programs, such as seminars and workshops, has been conducted, there is some evidence that participants can increase awareness and knowledge (Stritter and Hain, 1977; Bland, 1980). Evaluation of efforts to improve clinical teaching have focused on process evaluation; only one study has attempted product evaluation. Petzel, Harris, and Masler (1982) linked student learning to specific clinical teaching behaviors.

This paper presents the development and evaluation of a workshop designed to improve clinical teaching by residents. The first two years' results will be analyzed to reveal why and how experimentation to effect behavioral change is progressing. Questions for future study will be raised and a plan for a complete program to improve clinical instruction will be suggested.

Workshop Development and Evaluation

A program to improve residents' clinical teaching has been underway at the LSU School of Medicine since 1982. Residents are teachers as well as learners; in fact, they frequently have more contact time and therefore more opportunity to teach than do attending physicians. The workshop method of

instruction was chosen initially because it has been shown to increase knowledge for medical faculty. In comparison with other methods of educating faculty, such as individual consultation or assessment, self-instructional materials, or sabbatical leave, workshops have several advantages. The format is brief and allows active participation, appropriate for adult learners; it isolates the participants from the work context to reduce interference with learning. Relatively large numbers (25-35) of persons can be taught in a workshop, an important consideration (Bland, 1980).

At LSU, workshop attendance is required of persons in all specialties during their first year of postgraduate education. The chief residents in each program assign the interns to the workshops, which are given in the middle of the academic year-December through February.

A team consisting of an educator, a clinical faculty member, and carefully selected senior residents plan and teach the workshop. Stritter and Flair's monograph (1980) was chosen as a framework of content. The principles explicated there have a theoretical base (Gagne; 1977), and they are applicable to a wide variety of settings and learners. The objectives for the residents are to be able to express the principles of clinical teaching, state the method for teaching clinical skills, give feedback to learners, and have more confidence in their teaching. These objectives can be classified as verbal information, intellectual skill, and attitudes. Three sessions are designed for residents to attain the objectives: (1) small-group discussions about techniques and problems encountered in clinical teaching; (2) a team lecture with videotaped examples of the principles; (3) role-playing sessions for practice.

The workshop has been evaluated by participant feedback, participant self-ratings, and student ratings of residents' teaching skill. During the first two years of the program, 138 residents participated in the workshop. Of these, 93% stated that they attained the four objectives of the workshop. Their reaction to the individual sessions was positive: 91% thought the presented information relevant; 80% found the small-group discussions profitable. In evaluating the sessions, 71% said the role-playing was helpful; 69% thought the videotaped demonstrations were effective. An important finding is that 70% of the participants stated they would like additional training. The type of additional training most participants (54%)favored was small-group instruction.

Self-assessment of clinical teaching skills can raise the awareness of the clinical teacher and also measure the effectiveness of instructional programs. Both purposes are served by having residents use the Inventory of Teacher Behaviors (Irby, 1978) to rate their clinical teaching skills before and again three months after the workshop.

Analyses of the residents' self-ratings each year (paired t-tests) show that they consider their skills significantly improved after the workshop. On a scale of 1 (low) to 7 (high), the residents rate themselves moderately high before the workshop and high after the workshop. Figures 1 and 2 illustrate the mean differences with 95% confidence levels for each of the eight Inventory dimensions and a summary score. The data for the two years are displayed separately because differences on the dimensions of rapport and professional characteristics were not statistically significant in 1983-84. All other dimensions reported significant improvement by residents who participated in the workshop during both years.

Insert Figures 1 and 2 about here

A more objective evaluation of the workshop's effectiveness was provided by students during the 1983-1984 academic term. At the conclusion of each clerkship, third-year students rated the residents' teaching skills on the Clinical Teaching Assessment Form, a shortened version of the Inventory of Teacher Behaviors.

The scores on 38 residents who had been rated by three or more students (total:257 ratings) before and after attending the workshop were averaged and analyzed by paired t-tests (Table 1). The residents who attended the workshop were rated significantly higher by students afterward on two of the nine dimensions of the Clinical Teaching Assessment Form - Organization/Clarity and Knowledgeable/Analytical. On two additional dimensions, the results approached significance -Demonstrates Clinical Skills and Procedures and Provides Direction and Feedback.

Insert Table 1 about here

Conclusions

These results are encouraging. With only four and one-half hours of instruction, residents and students perceive increases in knowledge and skill in clinical teaching. Two of the workshop objectives are to be able to state the method for teaching clinical skills and to give feedback. The students' ratings showed some improvement in giving direction and feedback and in demonstrating clinical skills. Although we would like to believe there is a causal link between the workshop training and the students' perception of the

residents' teaching techniques, rival hypotheses such as the residents' maturing clinical competence cannot be ruled out. The students' ratings do not give evidence ofimprovement of overall teaching effectiveness. In addition, the investigators do not have objective evidence that the residents teach more frequently,although anecdotal evidence from some departments suggests that they do. Most importantly, the first two years' evaluation has not yielded evidence of actual behavioral change or of the ultimate outcome-improvement in student learning. As these results began to emerge during the first year and one-half of the program, we undertook pilot work to develop additional training experiences for the residents. To change behaviors, more than an introductory workshop is needed.

Residency directors and experienced clinical faculty recognize that medical training is especially intensive during the first and second years of residency. Residents' teaching ability depends, to a certain extent, on medical knowledge and skill; acquiring more knowledge of the disease process and treatment and more intellectual skill in diagnosis and in performing clinical procedures naturally increases their capability and confidence as teachers. Delivering instruction in clinical teaching to residents throughout the first two years should capitalize on the residents' developing medical knowledge and skill. Therefore, the workshop will continue to be given during the middle of the first year of the residency and additional training will be given early in the second year.

Pilot Study

To study the behavioral effects of the additional training, we selected one specific experience: a student presenting a patient case to a resident.

Several factors make this a profitable study:

The case presentation:

1. provides one of the most frequent opportunities for residents to teach students
2. has fairly well defined content and organization
3. demands a range of teaching skills including intellectual and interpersonal skills
4. helps in teaching interpersonal skills learned that can then be transferred to the doctor-patient relationship
5. is used with a few variations by physicians in all specialties
6. is used by physicians thoughout their careers;
7. involves explicit teaching that has been largely neglected until recently (Anderson and others, 1984; Weinholtz, 1983).

In January 1984 we began to videotape residents as they taught students how to present patient cases in their normal hospital setting. This pilot work helped to focus on three questions. How do residents teach students? Which teaching skills of residents need to be improved? What methods of instruction will effect the desired improvement? The first question is fundamental. Only one descriptive study of residents involved in the act of teaching has been reported (Tremonti and Biddle, 1982). Ethnographic studies of attending physicians' ward rounds (Mattern, Weinholtz, and Friedman, 1983) emphasize the necessity for this type of study and develop the methodology. The other two questions pertain to teaching improvement and cannot be fully answered until descriptive studies are done. Of course, experimental, correlational, and descriptive studies can proceed simultaneously. The major

thrust of our work is improving teaching competence among the residents, but content for the program is now being derived from study of residents in clinical teaching situations. Repeated observations of the pilot videotapes showed that many residents do not effectively use three essential teaching principles - communicate objectives, direct attention, and give feedback.

During the pilot study, rating scales to measure behaviors related to these principles were developed. Student performance is rated first; then resident teaching performance is rated. The assumption is that teaching and learning are interactive; the resident's teaching skills must be adapted to the student's performance. Procedures for videotaping the case presentations were also developed.

Current Experimentation

A three-year study to develop and evaluate an expanded progam of clinical teaching skills for residents was begun in July, 1984. A total of 68 residents from Obstetrics/Gynecology, Medicine, and Family Medicine are randomly assigned to experimental and control groups during the first and second years of their postgraduate medical training. The control residents receive no instruction about clinical teaching; the experimental residents attend a planned program of instruction. During the first year, these residents attend the workshop and receive printed materials giving further information and clinical applications of the teaching principles. During the early part of the second year, they will participate in a series of small-group instructional sessions designed to improve their teaching behaviors.

These sessions will include live and videotaped demonstrations and practice of the three principles. Between each of the group sessions, the residents will critique their videotapes using the rating scales and practice the skills in their daily work with students.

In addition to the three evaluation measures already implemented for the workshop, two new evaluation methods are being used--trained raters' measures of the behaviors observed on the videotapes and structured interviews with residents selected for high, medium, and low clinical competence. These five methods of evaluation should enable us to examine the program quantitatively and qualitatively.

Questions and Future Directions

Although this three-year study may answer, at least in part, the questions posed, much work remains to be done on the description of resident teaching as well as development and evaluation of teaching improvement programs.

The ultimate question about improving clinical teaching is, "If faculty and residents teach more and better, do students learn more?" Measuring improvement in teaching behaviors (process evaluation) is the first step; linking teaching performance to student learning (product evaluation) is another necessary step. The many variables present in the clinical instruction system make this a challenging research question. The value of clinical teaching improvement programs, however, is not likely to be widely accepted within medical schools without evidence of improved student learning.

Resident teaching is one component of a highly integrated system of clinical patient care and instruction. Faculty are at the apex of the system and students are at its base; residents serve a pivotal role interacting both as learners of the faculty and as teachers of the students. The improvement of resident teaching cannot be undertaken without actively involving faculty and students because the functioning unit in clinical instruction is the ward team.

A complete program to improve clinical instruction would involve faculty, residents, and students. Methods of instruction would be selected to achieve specific results with each group. The pyramid system, which has been successfully used in business and industrial training, seems applicable in medical education. A few persons, those at the apex of the pyramid, are intensively trained. These people then conduct training for larger groups, those at the pyramid base. Selected faculty and residents from each specialty within a medical school could be intensively trained by individual observation/consultation and seminars. This training should effect long-term improvement in teaching techniques. These persons could then conduct training for other faculty, residents, and students. They could give workshops for these various groups to raise awareness of teaching/learning opportunities and create a common understanding of sound learning principles. Within each department the "trainers" could use the Seminar Method and Intensive Feedback Method according to the needs of individuals and groups.

Over a period of several years a pyramid training system should infuse sound learning principles into the ward teams--attending physicians, residents, students--thus enhancing and supporting the daily climate for learning. The most important component of the existing system of clinical instruction is working with patients as a member of the ward team--learning by experience to interview, examine, diagnose, and treat patients. If meaningful and lasting improvement in clinical instruction is to take place, sound learning principles must permeate every level of persons involved in the daily ward work. The challenge for medical education reseachers is to describe sound principles of clinical instruction, validate methods for effecting improvement, and implement the methods within the existing system.

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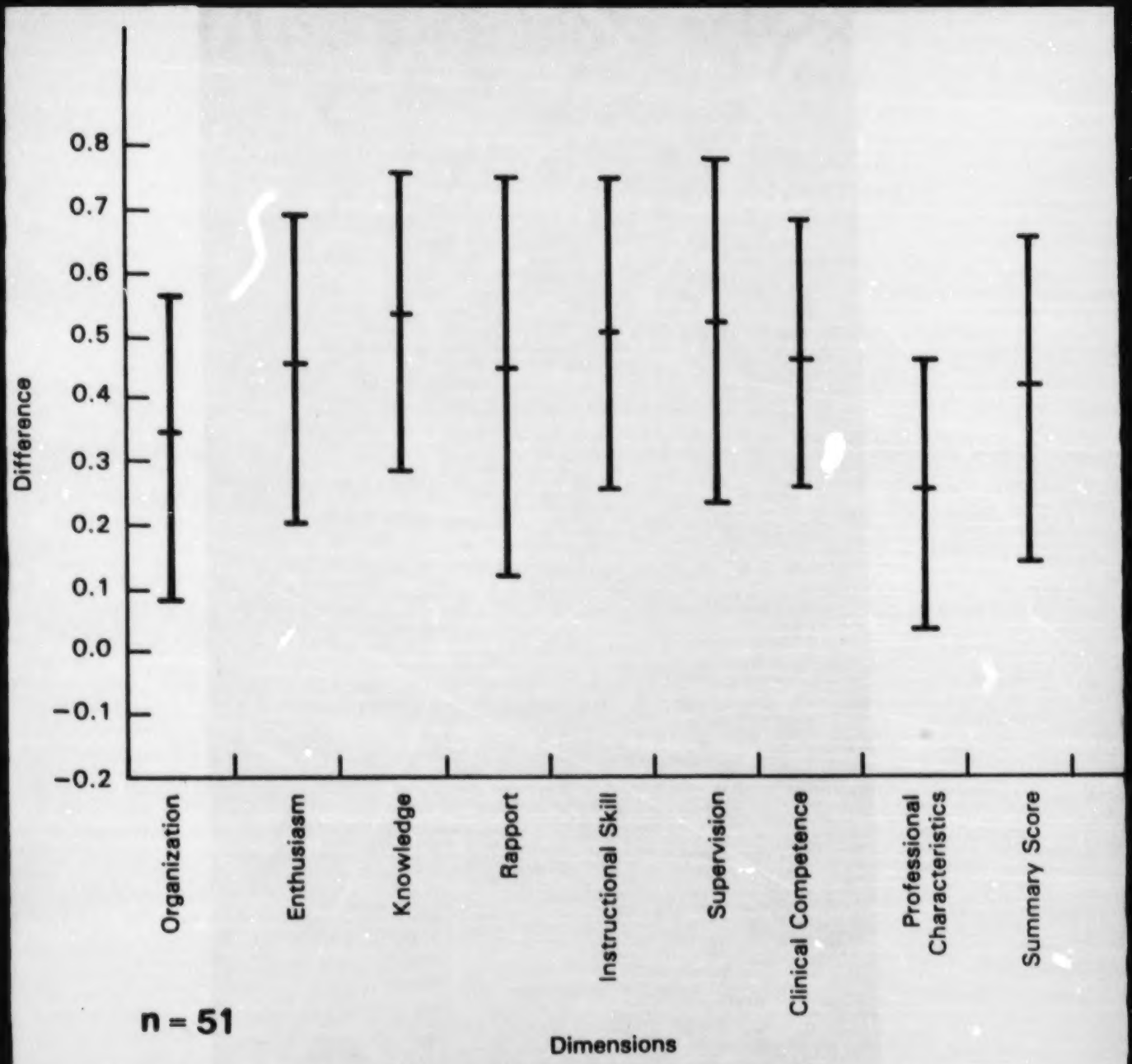

Figure 1. Mean differences with 95% confidence intervals of residents' self-ratings between post- workshop scores and pre-workshop scores on the Inventory of Teacher Behavoirs (1983).

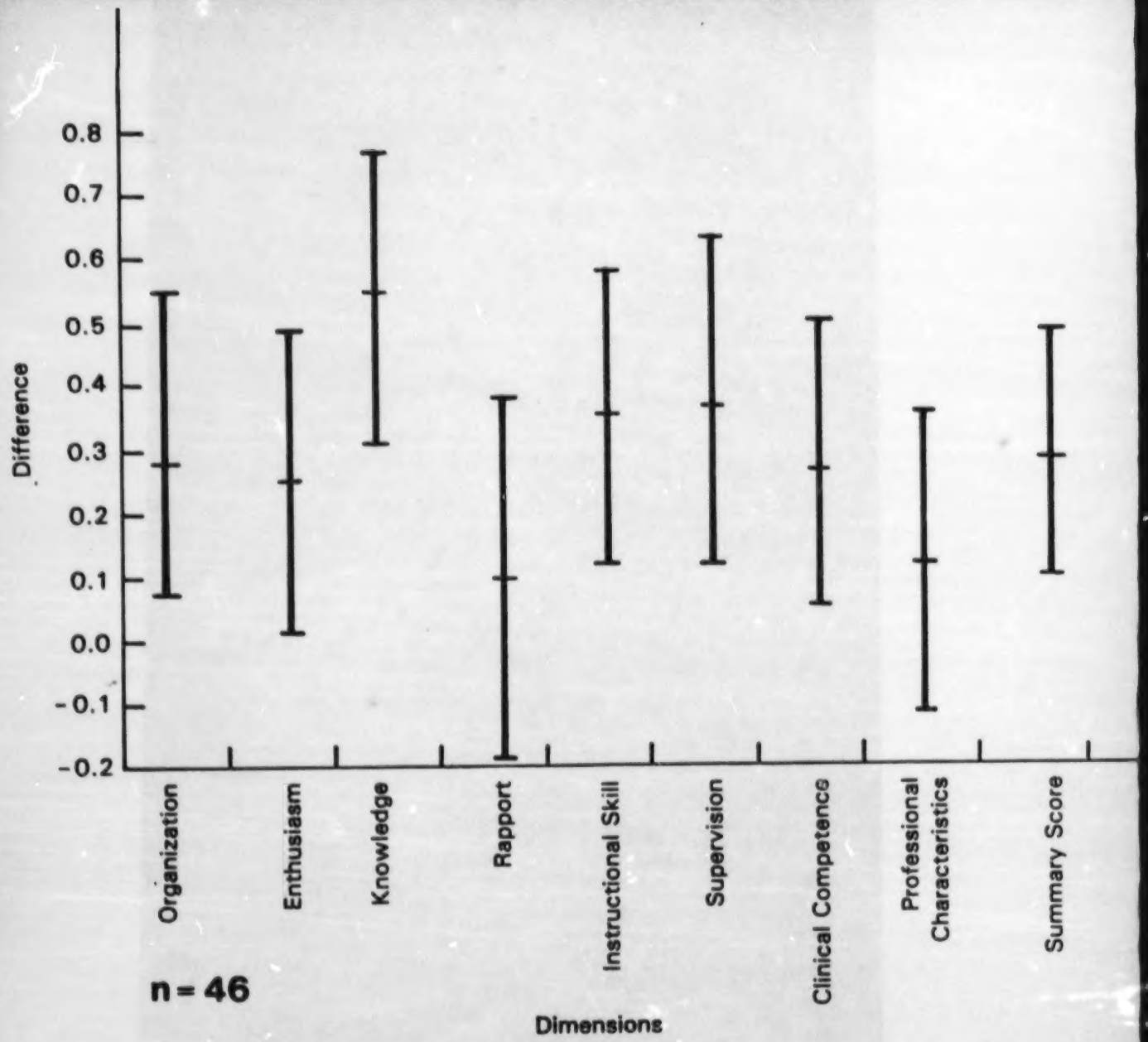

Figure 2. Mean differences with 95% confidence intervals of residents' self-ratings between post-workshop scores and pre-workshop scores on the Inventory of Teacher Behaviors (1984).

TABLE 1

MEAN DIFFERENCES OF POST-PRE WORKSHOP EVALUATIONS OF RESIDENTS BY STUDENTS ON THE CLINICAL TEACHING ASSESSMENT FORM (1983-84)

DIMENSIONS	POST-PRE WORKSHOP MEAN	PAIRED t-Tests	p-VALUES
Clear and Oraganized	0.303	2.01	$< .05$
Enthusiastic/Stimulating	0.095	0.54	
Establishes Rapport	0.037	0.19	
Actively Involves Students	−0.073	− 0.42	
Knowledgeable/Analytical	0.278	1.91	$< .05$
Demonstrates Clinical Skills and Procedures	0.219	1.55	$.05 < p > .10$
Provides Direction and Feedback	0.257	1.49	$.05 < p > .10$
Accessible	0.025	0.14	
Overall Teaching Effectiveness	0.188	1.23	

n = 38 residents